Cross Country Skiing

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Program Purpose: The purpose of this program is to introduce students to cross-country skiing and practice basic skiing skills.

Program Length: 1 hour minimum

Ideal Age: Grades 2nd - Adult

Maximum Number of Participants: 25
Currently, we own:

- 5 sets of 80 cm skis (pre-school/early elementary)
- 10 sets of 120 cm skis (elementary)
- 30 sets of 160 cm skis (middle school and above)

Teacher Preparation:
Before the class arrives:

- Check to see that the boots, skis and poles are in order.
- If you will have enough time to introduce the history of Nordic ski equipment, place demonstration equipment on the table.

Basic Outline:

1. Introduction (10-30 minutes)
    a. Cultural History + Creation of Equipment is appendix A if you have time and want to include it
    b. Fitting Equipment
2. Skills (20-30 minutes)
3. Skiing (20-30 minutes)
4. Conclusion (10 minutes)

Introduction (10-30 minutes):

1. **Assess Student Readiness**
    a. Welcome everyone to the class and introduce the plan for the day.
    b. Make sure everyone is dressed appropriately and has taken a water/bathroom break.
    c. Start an introductory conversation to assess prior knowledge/experience and to get youth excited to ski. Some potential conversation starters are below:
        i. What are some of our favorite winter activities?
        ii. Who has cross-country skied before/never skied before?
        iii. What do you think of when you think of cross-country skiing.
2. **Fitting Equipment**
    a. Remember to log statistics for the Nordic Rocks Program!
    b. Poles
        i. To fit the poles, students should stand and place the tip on the floor – the top of the pole should just about reach their shoulder. (It's better to have poles on the short side rather than long.) Also, demonstrate how to bring your hand up the bottom of the loop and how to grasp the pole over the straps. The poles are arranged by color depending on their length.
    c. Skis
        i. Make sure everyone has a pair with a left and a right ski as indicated on the binding. Skis should be removed from and returned to the rack as a pair. In general:

1. 80 cm skis are ideal for preschool/early elementary (under 3 feet tall)
2. 120 cm skis are good for elementary (about 4 feet tall)
3. 160 cm skis are good for middle school and above (about 5 feet tall)
    a. Outside of Upham skis get much longer (up to 210 cm) and are fit more precisely using a combination of weight, height, and ability.

Program Activities- Skills Section (20-30 minutes):

1. Skis only, no poles yet!
    a. Practice the movement of skis and balancing with a few of the following drills.
        i. Step-glide: With only one ski on, practice the basic step-glide movement as you shift your weight from side to side. Practice on each side of the body.
        ii. Step-Step-Glide: Continue practicing shifting weight between skis, but this time with 2 skis on. After participants are comfortable, ask them to also focus on their arms and moving them as the opposite foot moves.
        iii. Glide: for advance skiers, they can focus on gliding the entire way across the field and trying to keep the momentum going the whole time.
2. Adding in poles
    a. Poles should never go in front of the foot, so the following drills can be used to practice.
        i. Gorilla Arms: with the pole straps on, but without holding onto the poles, stick your poles behind you, relax the shoulders and hang your hands down. As you move forward and bring your arm up, the poles should naturally land beside your foot (not in front) to provide push. If you put them in front, it will slow you down!
        ii. Using Poles Normally: Hold onto poles and ski across the field, making sure they do not come in front of your foot and are moving with the opposite foot.
3. Learning additional skills
    a. Falling: Explain that most of us will fall today. We need to know how to do it properly and how to get back up. If you have a choice, it's best to fall onto your butt, in a sitting position rather than falling forward, allowing for more cushioning and won't break wrists. Demonstrate how to properly get up by leaning forward, crawling into a kneeling position and standing up by pushing off the ground or thigh (not the poles, so they don't break). Have everyone practice this a couple times.
    b. Daisy turn: Show how to turn by lifting up and moving one foot at a time, turning each a little until you're going the way you want to (called a daisy turn for the pattern in the snow made). To turn left, move left foot first and vice versa
    c. Stopping - Explain how to snowplow by making a "V" with their skis and leaning on the inside of their skis. Explain that it should look like a pizza slice with their toes in. Another way is to just sit down!
    d. Uphill – If a hill is too steep to walk up, point your toes out sideways and "duck-walk/herringbone" up the hill. Dig your edges in and put your poles behind your skis to help push you up. If the hill is too steep, walk sideways up the hill, with your skis perpendicular to the incline. Place weight on the uphill side of your skis, taking small steps.
    e. Downhill - Get into the "snowplow" position and turn ankles in. Hold your hands out in front of you as if you were holding a tray. Have your back straight and knees bent. The more pressure you put on the inside of your skis the slower you will go.

Program Activities- Skiing (20-30 minutes):

1. Skiing the trails: If there is enough snow, hit the trail. The blue triangle trail trail starts at the southwest corner of the sandlot. Follow the blue triangles on the trees on a loop behind the nature center for the beginner course. It loops back around to the northwest corner of the sand lot.
    a. If they would like to try the advanced course, you can take your group across the road to the Westridge Trail. Cross as a group using orange safety flags. The skis must be carried across to keep from scratching the ski bases on the pavement.
2. Less Snow Options: Game time!
    a. Red light, green light: to practice gliding and stopping
    b. Pool Noodle name game: to practice daisy turns
    c. Relay races: to practice speed, maneuverability and even falling if you want to make everyone fall at the end of the relay course.
    d. Other creative games as desired!

Conclusion:

Walk back to the Crafts Building to put away the ski equipment and to conclude the class. Remind your group to put away all equipment as a pair from where they got it. Notify an Upham coordinator if any equipment is in need of repair. **Remember to log statistics for the Nordic Rocks Program.**

After all the equipment is put back in its correct place, ask some processing or reflection questions. Some examples are:

- Why do we teach Nordic skiing at Upham Woods?
- Why is it important to learn an outdoor activity like Nordic skiing when living in a cold weather climate like Wisconsin?
- How did the invention of Nordic skis affect the people of northern Europe?
- What did you enjoy about learning to cross-country ski and why?
- How can you use what you learned from this class in your everyday life?

Appendix A

1. **History-Cultural (if time)**

    Nordic skis were invented approximately 5,000 years ago in the Scandinavian Region of northern Europe. This is a part of the world that is covered in a blanket of oftentimes deep snow for much of the winter. Why would people living 5,000 years ago in Scandinavia invent such a mode of transportation?

    Early versions of Nordic skis, which will be discussed later, are similar to modern equipment in that they allow people to move more efficiently in deep snow. The long span of the skis displaces the weight of the user over a greater area on top of the snow. Skis allow the user to "float" on the snow's surface, as opposed to sinking down deep with every step (also known as post-holing, or post-holing). Skiing on top of the snow is much more efficient; post-holing is very slow and consumes much more energy. The can be demonstrated using a small, heavy rock and an old ski. Place the rock first in deep snow where it will readily sink down into the snow. Next place a ski on the same deep snow and then place the rock on top of the ski. Why doesn't the rock sink into the snow? The ski displaces the weight of the rock on the snow over the entire surface area of the ski. Before the advent of snowmobiles, roads and cars, Nordic skis allowed people in Scandinavian countries to travel longer distances during the winter more efficiently. Prehistoric people in the northern portions of North American came up with a different solution to the same problem; do you know what they invented? Snowshoes!

The first Nordic skis were simply long pieces of wood with a strap in the middle to keep the skier's foot in place on each ski. This works fine for going slowly on flat snow, but allows the skis to slip backwards on a slope. Thus, furs were added to the center of the skis for traction. The fur was placed with the hairs pointing backward so that the ski would slide forward easily, but grip into the snow when pushed backward.

Early bindings were simply pieces of leather which held the user's foot in place. Later, in the early 1900's, the three pin-style binding was invented. The three pin binding requires the use of special boots which have a flexible tongue that extends forward from the toe of the boot. The tongue has three holes formed or drilled into it that match the three pins of the binding. A clasp, known as the "bail" closes down on the tongue to hold it in place. There were several sizes of three pin binding/boot systems in use, which were not interchangeable, until one standard was developed in 1927, the Nordic Norm (the norm refers to the distance of 75 mm from outside pin to outside pin). This allowed any Nordic Norm boot to be used with any Nordic Norm binding. The Nordic Norm was the standard binding/boot system for over 50 years and is still in use today. In fact, we use the three pin Nordic Norm binding at Upham Woods because this style of binding is generally preferable in backcountry-like skiing conditions.

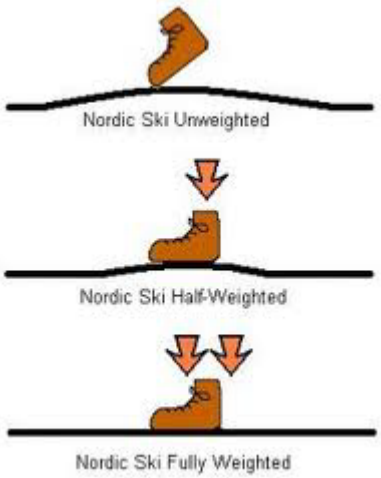
In the 1980's a totally different boot/binding system was designed called the New Nordic Norm (abbreviated NNN or triple N). The New Nordic Norm employs boots with a metal rod in place just below the toe which clicks down into a receiver clamp in the binding (demonstrate this with the demonstration NNN boot and binding). Several different variations of this style now exist from different manufacturers, but the concept is very similar.

Nordic skiing started to gain popularity as a sport in the late 1700's, first in northern Europe, but by the 1800 and 1900's, Nordic skiing's popularity spread throughout Europe and North America. Over the past couple hundred years, ski design and materials have evolved dramatically. The sport has grown partially because of the evolution of the equipment and the equipment has evolved because of the sport's popularity. Nordic skis are now used by millions of people across the planet for fun, recreation, and winter exercise, not just travel.

2. **History-Equipment**

Most modern Nordic skis have a wood core that has had numerous holes drilled or cut into it to make the ski lighter and more flexible. The outer surfaces of the ski are covered in fiberglass and/or plastic to make them strong, waterproof and to keep snow from sticking. The bottom surface of the ski is covered with an additional layer of plastic called the base.

One of the biggest advances in Nordic ski design was the invention of the camber, or upward curve in the middle, of the ski which allows for both a kick and glide section on the same ski. (Place a ski on a flat surface in front of your group to clearly illustrate the camber. Use the demonstration ski to also show the kick and glide sections of the ski.) The camber lifts the kick section, or traction part of the ski, off the snow during gliding. When you have equal weight on both skis—as when gliding—the traction part of the ski (the middle third that has either a textured pattern or wax for traction) remains arched up off the snow to ensure an easy glide. When you place all your weight on one ski, as would happen when pushing down to push forward, you completely flatten that ski against the snow, so that the kick zone



grips the snow and gives you backward traction to kick forward (Push down on the ski several times for your group to demonstrate). This is why your body weight is so important in determining your correct length of ski.

The grip or kick section of the ski gets traction in one of two ways: either the bottom of the ski has a manufactured texture pattern, a ski type called waxless, or the ski base is designed so waxes are applied which do all the work: slippery glide wax is applied to the glide section of the ski and sticky wax to the kick part of the ski, the latter ski called waxable.

Waxless skis are the most popular choice because they are convenient and provide grip in a variety of snow conditions. Their textured pattern digs into and grips the snow, though it reduces glide somewhat. Despite their name, waxless skis perform better with some glide wax applied to the tips and tails which we do here at Upham woods.

Waxable skis are more work, but they can outperform waxless models if their wax is precisely matched to snow conditions. The wax must be soft enough for snow crystals to dig in and grip, but not so soft that snow sticks to skis. In consistent temperatures above or below freezing, well-waxed skis perform superbly. When temperatures are erratic or right at the freezing point, waxing is difficult and waxless skis are the better choice.

Nordic skis come in different widths (hold up several examples of different width skis and compare them for your group). The width of the ski causes the ski to perform better on different snow types. The tracking mechanism on Nordic ski center groomers forms a packed track that is approximately 60-70 mm wide so most common Nordic skis are less than 70 mm wide so they can fit within the formed track. Because of this, this classification of Nordic ski is sometimes referred to as a track ski. Track skis perform very well on the firm, packed snow of a groomed trail; however, they perform poorly on unpacked powdery snow because they are relatively narrow. Track skis will tend to roll from side to side in deep, powdery snow. Trail skis or backcountry Nordic skis are wider than track skis and thus provide better floatation and stability on deep and/or powdery snow. Because they are wider than 60-70 mm they won't fit in the groomed tracks at Nordic ski center and thus are usually not allowed. Backcountry skis put more ski surface in contact with the snow, thus are slower and take more effort than a narrower ski such as a track ski.

The binding keeps the ski boot attached to the ski. On Nordic skis the binding holds the front of the boot in place yet pivots to allow the heel to lift. We use a new, over-the-boot binding designed by Nodic Rocks.

Ski poles are usually made out of aluminum or fiberglass. Older poles were constructed of wood. The pole grip and strap keeps the pole in your hand and transfers some of the user's arm motion to the ground to help propel the skier forward, though the kick portion of the ski should do most of the work. The basket of the pole keeps the pole from sinking too far down in the snow.